



684.2834

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)
HIROSHI SATO) Examiner: Unassigned
Appln. No.: 09/300,845) Group Art Unit: 2877
Filed: April 28, 1999)
For: PROJECTION EXPOSURE) October 26, 1999
APPARATUS AND DEVICE)
MANUFACTURING METHOD)
USING THE SAME)

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OCT 28 1999
TECHNOLOGY CENTER 2800

The Assistant Commissioner for Patents
Washington, D.C. 20231

INFORMATION DISCLOSURE STATEMENT

Sir:

To comply with the duty of disclosure under 37 CFR 1.56 and in accordance with the practice under 37 CFR 1.97 and 1.98, the Examiner's attention is directed to the documents listed on the enclosed PTO-1449 Form and to the copending applications discussed below. Copies of the listed documents are also enclosed.

(1) Japanese patent document No. 5-47626, discussed on page 9 of the subject specification, relates to an image projection method and the manufacture of a semiconductor device using the same.

(2) Japanese patent document No. 5-47640, also discussed on page 9 of the subject specification, relates to an illuminator and a projection aligner using the same.

(3) Japanese patent document No. 9-254386, discussed on pages 16 and 21 of the subject specification, relates to an ink jet recording printing head and its production.

(4) Japanese patent document No. 9-190969, discussed on page 23 of the subject specification, relates to a projecting exposure system and the manufacture of a device using it.

(5) Japanese patent document No. 9-126335, discussed on page 24 of the subject specification, relates to an ink jet recording printing head and its production.

Copending Application No. 09/116,883, filed July 16, 1998, being examined in art unit 2851, relates to an exposure apparatus and a device manufacturing method. In one aspect, this application recites an exposure apparatus for illuminating a pattern with exposure light and for projecting the pattern onto a substrate through a projection optical system. The apparatus includes an illuminometer being movable along a pattern projection plane with its light receiving portion being registered with the pattern projection plane and movable along an optical axis direction of the projection optical system, for measurement of an illuminance distribution on the pattern projection plane, and masking means having a variable size aperture for regulating an exposure range on the pattern projection plane. The masking means regulates the exposure range so that a light

intensity distribution at a pupil plane of the optical system is defined at a plane displaced from the pattern projection plane in the optical axis direction, and the illuminometer is moved along the displaced plane while the light receiving portion of the illuminometer is registered with the displaced plane, to perform the measurement of the light intensity distribution.

In addition to items, (1), (2) and (4), discussed above, the following art was cited during the prosecution of the '883 application:

(6) Japanese patent document No. 6-204123 relates to an illuminator and a projection aligner using the same.

(7) Japanese patent document No. 5-47629 relates to a manufacturing method of semiconductor devices and a projection aligner using the same.

(8) to (10) U.S. Patent No. 5,861,994, No. 5,798,824 and No. 5,739,899.

Copending Application No. 09/066,840, filed April 28, 1998, also being examined in art unit 2851, relates to a projection exposure apparatus and a device manufacturing method. In one aspect, this application recites a projection exposure apparatus that includes an illumination optical system for illuminating an original with light from a light source and a projection optical system for projecting a pattern of the original, illuminated with the light, onto a substrate to be exposed. The illumination optical system

includes an optical integrator having a plurality of lenses, and a movable member disposed at a light entrance side of the optical integrator and being movable in a direction intersecting an optical axis. The movable member has light quantity adjusting means for blocking a portion of light directed to a lens of the plurality of lenses to thereby change a light quantity distribution.

In addition to items (1), (2) and (8) discussed above, the following art was cited during the prosecution of the '840 application:

(11) Japanese patent document No. 9-36026 relates to a projection aligner and a manufacturing method of semiconductor devices using the same apparatus.

(12) Japanese patent document No. 7-183200 relates to an aligner.

(13) Japanese patent document No. 7-37798 relates to a projection aligner.

(14) Japanese patent document No. 6-84759 relates to an illuminator.

(15) Japanese patent document No. 1-42821 relates to a lighting device.

(16) to (24) U.S. Patent No. 4,521,082, No. 5,305,054, No. 5,726,739, No. 5,576,801, No. 5,526,039, No. 5,726,793, No. 5,459,547, No. 5,262,822 and No. 5,489,966.

In accordance with 37 CFR 1.98(a)(2)(iii), no copies of the related applications discussed above have been

provided. Accordingly, the Examiner is referred to the application files of the U.S. Patent and Trademark Office for consideration of those applications and of any additional art cited therein.

Applicant requests that the Examiner consider the cited information and return an initialed copy of the enclosed PTO-1449 Form indicating that such information has been considered.

Applicant believes that no fees should be incurred in connection with filing this paper. Nevertheless, the Assistant Commissioner is authorized to charge Deposit Account No. 06-1205 should any fees be associated herewith. A duplicate of this paper is enclosed for this purpose.

Applicant's undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should be directed to our address listed below.

Respectfully submitted,



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